WHAT IS CLAIMED IS:

1. A solid electrolyte including a complex compound which is composed of polyvinyl alcohol, water, and at least one inorganic compound selected from silicic acid compound, tungstic acid compound, molybdic acid compound, stannic acid compound, and zirconic acid compound,

characterized by being produced by replacing a part or all of hydroxyl groups of polyvinyl alcohol domain to groups each of which has a water absorption less than that of said hydroxyl group.

2. A solid electrolyte as claimed in Claim 1, wherein a selected one of acetalizing reaction, etherifying reaction, and esterifying reaction is used on replacing the part or all of hydroxyl groups of polyvinyl alcohol domain to groups each of which has a water absorption less than that of said hydroxyl group.

3. A solid electrolyte including a complex compound which is composed of polyvinyl alcohol, water, and at least one inorganic compound selected from silicic acid compound, tungstic acid, molybdic acid compound, stannic acid compound, and zirconic acid compound, characterized by being produced by carrying out a reaction of aldehyde and said solid electrolyte including complex compound.

4. A solid electrolyte as claimed in Claim 3, wherein the reaction of the aldehyde and the solid electrolyte includes acetalizing reaction of polyvinyl alcohol domain in the complex compound.

5. A solid electrolyte as claimed in any one of Claims 3 and 4, wherein the reaction of the aldehyde and the solid electrolyte is carried out under a condition of the aldehyde and acid.

6. A solid electrolyte as claimed in any one of Claims 3, 4, and 5, wherein the aldehyde is at least one selected from n-butyric aldehyde, isobutyric aldehyde, and benzoic aldehyde.

7. A solid electrolyte as claimed in any one of Claims 1 to 6, wherein the complex compound included in the solid electrolyte has at least one selected from phosphorus, boron, aluminum, titanium, calcium, strontium, and barium compound.

8. A solid electrolyte as claimed in any one of Claims 1 to 6, wherein the complex compound included in the solid electrolyte is produced by neutralizing at least one alkali metal salt selected from silicic acid, tungstic acid, molybdic acid, and stannic acid, by acid in the solution with polyvinyl alcohol coexisting or by neutralizing zirconium chloride or zirconium oxychloride by alkali in the solution with polyvinyl alcohol coexisting, and by removing water as a solvent.

9. A solid electrolyte as claimed in Claim 8, wherein:

a raw solution before neutralization includes at least one alkali metal salt selected from the boric acid and the phosphoric acid or at least one selected from the aluminum

salt, the titanium salt, the calcium salt, the strontium salt, the barium salt, and the boric acid; and

the complex compound included in the solid electrolyte including at least one selected from phosphorus, boron, aluminum, titanium, calcium, strontium, and barium compound.

10. A solid electrolyte as claimed in any one of Claims 8 and 9, wherein the solid electrolyte including the complex compound is subjected to a heating treatment at a temperature which is not less than 100℃.

11. A solid electrolyte as claimed in any one of Claims 1 to 10, wherein the solid electrolyte including the complex compound is subjected to an immersing treatment under an acidic solution.

12. A solid electrolyte as claimed in any one of Claims 1 to 10, wherein the solid electrolyte including the complex compound is subjected to an immersing treatment under an alkali solution.

13. An electrochemical system characterized by using the solid electrolyte claimed in any one of Claims 1 to 12.

14. An electrochemical system using the solid electrolyte as claimed in Claim 13, wherein the electrochemical system is any one of a fuel cell, a steam pump, a dehumidifier, an air conditioner, an electro chromic device, an electrolytic device, an electrolytic hydrogen producing device, an electrolytic hydrogen peroxide producing apparatus, an

electrolyzed water producing apparatus, a humidity sensor, a hydrogen sensor, a primary battery, a secondary battery, an optical switch system, and a new battery system using a multivalent metal.

15. An electrochemical system using the solid electrolyte as claimed in Claim 13, wherein the electrochemical system is a fuel cell of direct methanol type.